What is claimed is:

1. A silicon- and magnesium-containing porous hydroxyapatite, having three-dimensionally connected pores in size of 200 - 500 μm, being similar to a human cancellous bone in structure, and comprising silicon and magnesium ions in an amount of 0.05 - 5 wt%, respectively.

2. A preparation method of a silicon- and magnesium-containing porous hydroxyapatite, comprising the steps of:

(1) performing a hydrothermal treatment of a coral sample pre-treated with a NaOCl solution in an aqueous $(NH_4)_2HPO_4$ solution; and

(2) performing a solvothermal treatment of the coral sample prepared in step (1) in a saturated solution of silicon acetate in acetone, to obtain the silicon- and magnesium-containing porous hydroxyapatite.

3. The preparation method according to claim 2, wherein contents of silicon and magnesium in the silicon- and magnesium-containing porous hydroxyapatite obtained in step (2) are respectively 0.05 - 5 wt %.

4. The preparation method according to claim 2, wherein the step (1) is performed at 150 - 300°C for 6 - 36 hours.

5. The preparation method according to claim 2, wherein the step (2) is performed at 100 - 250°C for 12 - 36 hours.

6. The preparation method according to claim 2, wherein the step (1) is repeatedly performed after completion of the step (2), to obtain a porous hydroxyapatite in single phase.

7. A silicon- and magnesium-containing porous hydroxyapatite used for an artificial bone including a spine or long bone, an orbital implant, or a chin implant, having three-dimensionally connected pores in size of 200 - 500 μm, being similar to a human cancellous bone in structure, and comprising silicon and magnesium ions in an amount of 0.05 - 5 wt%, respectively.